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Still more startling things are reported by MM. Bourreau and Burot of Rochefort, being nothing less than 'stigmatization' by suggestion, in a certain patient, i.e., the bleeding of spots of the skin at word of command. They have also seen, and convinced others, that this patient and one other, were influenced by medicines *in closed vials held near them*, salivated and sweated by Jaborandi, vomited by ipecac, purged by scammony, put to sleep by opium, etc. In these experiments the subjects were not hypnotized. They remind one of observations published long ago by Dr. J. R. Buchanan, and republished last year in his work, 'Psychometry.' Thus miracles expelled by 'scientific good sense' clamor again for admission. In particular the limits of suggestion have not to be re-tested. The new results seem to point towards some effects that may be direct and physical, and not due to suggestion or expectation. We are as yet but on the threshold of the subject.

If one wishes to see what hopes for success the method may inspire, one should read the brilliant article of Mr. F. W. H. Myers, entitled 'The human personality,' in the *Fortnightly review* for November. As Mr. Myers there says, we hold the wand of Hermes, which we have not learned to wield.

S. E.

THE UTILIZATION OF BY-PRODUCTS IN CHARCOAL-BURNING.

IN many processes for the conversion of crude materials there is much waste, which is likely to be remedied only when such materials become scarcer, and hence more costly. In producing charcoal for use in the iron manufacture, the wood is commonly burned simply for the sake of the charcoal itself; and brick, dome-shaped ovens are used, from which the smoke and other products driven off by the process of slow combustion pass freely into the air. But in some cases such of the products as are commercially valuable are saved, with results that render it surprising that more care is not usually taken to retrieve what is so often lost. The success which has been met with at Elk Rapids, Michigan, in saving and profitably utilizing the by-products of charcoal-burning, is worthy of imitation.

At this place is a blast-furnace, turning out some seventy tons of charcoal-iron daily, and consuming the charcoal from one hundred and twenty-five cords of wood, previously carbonized in thirty-five kilns. The smoke and vapors given off in the latter process are drawn — by means of two exhaust-fans three feet in diameter, and mak-

ing twelve hundred revolutions per minute — through the bottom of the kilns, and thence through a long wooden pipe forty-two inches in diameter, to the chemical works. Here the vapors are distributed to ten condensers, each containing seventy-five copper tubes two and a fourth inches in diameter, through which cold water is passed. So much of the vapor as is condensed is then drawn off into a large settling-tank: the uncondensed part is forced under the boilers by steam-injectors and burned, thus helping to furnish the motive power required at the works. In the tank the larger part of the tar settles to the bottom. This tar is now mixed with sawdust, and burned under the boilers; although formerly, when more in demand, it was drawn off and barrelled for market.

The remaining liquor is pumped to a second tank, and neutralized with lime. After the impurities have had time to settle, it is conveyed to a still, where the wood alcohol is distilled from the acetate of lime just produced. The liquor of acetate of lime is next evaporated by steam-heat nearly to the granulating point, then conveyed to grainers, and, by the further application of steam, it is obtained in the solid state. Finally it is shovelled out, drained, dried in pans, and put up in bags as the acetate of lime of commerce. The capacity of the works is 10,000 pounds of acetate of lime per day.

The alcohol, on issuing from the still, has a strength of eight per cent; but further distillation brings it to eighty-five per cent, when it is barrelled for shipment. It is, however, again refined by other parties to ninety-five per cent alcohol, and used for various mechanical purposes. The daily production can reach one hundred and seventy gallons.

AN experiment has recently been tried at the London inventions exhibition aquarium, by Mr. W. August Carter, with a view to discovering how far fish are prone to sleep. After close examination, he found that among fresh-water fish the roach, dace, gudgeon, carp, tench, minnow, and catfish sleep periodically in common with terrestrial animals. The same instincts were found to actuate marine fish, of which the following were observed to be equally influenced by somnolence; viz., the wrasse, conger eel, dory, dogfish, wrasse bass, and all species of flat fish. Mr. Carter states, that, so far as he can discover, the goldfish, pike, and angler-fish never sleep, but rest periodically. Desire for sleep among fish varies according to meteorological conditions. Fish do not necessarily select night-time for repose.